WHAT IS CLAIMED IS:

1   1. A system for propagating error status over an error checking and correcting

2   (ECC) protected channel comprising:

3   a first device, the first device receiving data and an error status associated with

4   the data, the first device generating check bits for the data based on a first ECC code

5   and combining the check bits with the data to form at least one codeword;

6   a channel operably connected to the first device, the first device sending the at

7   least one codeword across the channel, the first device inserting a triple error into a

8   nibble of one at least one codeword sent if the error status indicated an uncorrectable

9   error; and

10   a second device operably connected to the channel, the second device receiving

11   the at least one codeword sent across the channel, the second device detecting triple

12   errors within a nibble of the at least one codeword and any other single error in the at

13   least one codeword using a second ECC code.

1   2. The system according to claim 1, wherein the other single error comprises an

2   error introduced by the channel.

1   3. The system according to claim 1, wherein the first device includes a

2   controller, the controller receiving the error status.

1   4. The system according to claim 1, wherein the first device includes a code

2   generator, the code generator generating check bits for the data based on the first

3 ECC code and combining the check bits with the data to form the at least one

4 codeword.

1 5. The system according to claim 4, wherein the check bits are located in the at

2 least one codeword to allow for single 4 bit nibble error detection (S4ED).

1 6. The system according to claim 1, wherein the second ECC code comprises

2 the first ECC code with additional columns inserted denoting designated positions of

3 check bits, the check bit positions providing for single 4 bit nibble error detection

4 (S4ED).

1 7. The system according to claim 1, wherein a check bit is generated for each

2 row of the first ECC code, the data comprising at least one data word, each check bit

3 comprising the dot product of a row of the first ECC code and a data word.

1 8. The system according to claim 1, wherein the first device includes an error

2 injection circuit, the error injection circuit injecting a triple error into a nibble of the at

3 least one codeword if the error status indicated an uncorrectable error.

1 9. The system according to claim 1, wherein the second device includes a

2 syndrome processor, the syndrome processor receiving the at least one codeword and

3 re-computing the check bits on the data using the second ECC code, the second device

4 generating a syndrome by comparing the check bits in the at least one codeword with

5 the re-computed check bits.

1   10. The system according to claim 9, wherein the syndrome comprises the dot

2 product of the second ECC code AND each at least one codeword.

1   11. The system according to claim 9, further comprising an error classifier, the

2 error classifier classifying errors in the received at least one codeword based on the

3 syndrome.

1   12. The system according to claim 11, wherein the classification comprises one

2 of no error, correctable error, and uncorrectable error.

1   13. The system according to claim 1, wherein the error status indicates one of

2 no error, correctable error, and uncorrectable error.

1   14. The system according to claim 1, wherein the first ECC code comprises a

2 matrix.

1   15. A method for propagating error status over an error checking and correcting

2 (ECC) protected channel comprising:

3   receiving data and an error status associated with the data at a first device;

4   generating check bits for the data based on a first ECC code and combining the

5   check bits with the data to form at least one codeword at the first device;

6   sending the at least one codeword across a channel, the first device inserting a

7   triple error into a nibble of at least one codeword sent if the error status indicated an

8   uncorrectable error; and

9   receiving the at least one codeword sent across the channel by a second device,

10   the second device detecting any triple errors within a nibble of the at least one

11   codeword and any other single error in the at least one codeword using a second ECC

12   code.

1   16. The method according to claim 15, wherein the other single error comprises

2   an error introduced by the channel.

1   17. The method according to claim 15, further comprising placing the check bits

2   in the at least one codeword to allow for single 4 bit nibble error detection (S4ED).

1   18. The method according to claim 15, wherein the second ECC code comprises

2   the first ECC code with additional columns inserted denoting designated positions of

3   check bits, the check bit positions providing for single 4 bit nibble error detection

4   (S4ED).

1   19. The method according to claim 15, further comprising generating a check

2   bit for each row of the first ECC code, the data comprising at least one data word, each

3   check bit comprising the dot product of a row of the first ECC code and a data word.

1   20. The method according to claim 15, further comprising recomputing the check

2   bits on the data using the second ECC code by the second device, the second device

3   generating a syndrome by comparing the check bits in the at least one codeword with

4   the re-computed check bits.

1   21. The method according to claim 20, wherein the syndrome comprises the dot

2   product of the second ECC code AND each at least one codeword.

1   22 The method according to claim 20, further comprising using the syndrome

2   to classify errors in the received at least one codeword.

1   23. The method according to claim 20, further comprising determining a weight

2   of nibbles of the syndrome where the weight is the number of '1's in the syndrome, the

3   classification being based on the weight.

1   24. The method according to claim 22, wherein the classification comprises one

2   of no error, correctable error, and uncorrectable error.

1   25. The method according to claim 15, wherein the error status indicates one

2   of no error, correctable error, and uncorrectable error.

1   26. An article comprising a storage medium containing instructions stored

2   therein, the instructions when executed causing a processing device to perform:

3   receiving data and an error status associated with the data;

4   generating check bits for the data based on an ECC code and combining the

5   check bits with the data to form at least one codeword; and

6   sending the at least one codeword across a channel, the processing device

7   inserting a triple error into a nibble of the at least one codeword sent if the error status

8   indicated an uncorrectable error.

1   27. The article according to claim 26, wherein the error status indicates one of

2   no error, correctable error, and uncorrectable error.

1   28. The article according to claim 26, wherein the ECC code comprises a matrix.

1   29. The article according to claim 26, wherein a check bit is generated for each

2   row of the ECC code, the data comprising at least one data word, each check bit

3   comprising the dot product of a row of the ECC code and a data word.